

Claims

WHAT IS CLAIMED IS:

1. - 101. (canceled)

102. (new) A light scaffolding plate to be laid, inserted, fitted, riveted, screw, glued, welded, or attached in another way in a metal, preferably aluminum frame of a façade or rolling scaffold provided for this purpose or to be suspended directly in a scaffold, in various lengths and widths as a sandwich panel having an upper and lower layer and spacers, located between them, made of plastic and methods for its manufacture,

wherein the upper and lower layers comprise sinkhole perforated sheet metal and are molded, fitting with one or more of the known scaffold floor systems or scaffold systems, bonded or embedded in a formfitting way through multiple rivets molded from the plastic of the spacer or its cover layers connected thereto.

103. (new) The light scaffolding plate made of the material composite according to claim 102, fiber-reinforced plastic composite,

wherein it has border or edge terminuses, molded-on lateral parts, intermediate webs, frame reinforcements, shelving and suspension fittings on the entire or interlocking parts of the width or length, also in known claw, hook, or rounded groove form to be hung in an angled profile, U-profile, or tubular profile, which are molded directly on or from, and also only or additionally has holes to be hung in the scaffold structure, which is provided with corresponding upright pins, the holes being reinforced by hollow rivets made of metal or plastic or by material compression at the hole edges.

104. (new) The light scaffolding plate according to claim 102,

wherein it is suitable for a falling weight test, with or without reinforcement, frameless, self-supporting, supporting a full load, and using 100, 150, 200, or 250 kg falling weight in the middle or another location between the suspensions of the plate and is stackable with or without a molded lateral protection part of 10, 15, or even, as a falling guard, of over 100 cm height.

105. (new) The light scaffolding plate according to claim 102,

wherein the lateral protection parts have identical or different thicknesses or recesses and/or openings, are transparent to light, are extended by independent second and/or third parts in height through placement, insertion, or other attachment and are fixed in such a way that they are removable and secured against unintentional detachment.

106. (new) The light scaffolding plate according to claim 102,

wherein the support core between the two cover layers of the plate is made of molded thermoplastic or duroplastic material, such as honeycombs, webs, caps, corrugated profiles, foamed or other spacer shapes, particularly having closed pores, with or without fiber, textile, or nonwoven material reinforcement or solid external and/or intermediate webs.

107. (new) The light scaffolding plate according to claim 102,

wherein one or both cover layers, the boundary terminuses, and/or molded-on lateral parts, suspension and paneling fittings and/or the support core are exclusively made of multilayered thermoplastic material, prepared with highly-oriented reinforcement elements having bidirectional molecular alignment, of identical or similarly high rigidity in strength and do not contain glass fibers or other reinforcements made of non-thermoplastic material and are thus completely recyclable.

108. (new) The light scaffolding plate according to claim 102,

wherein the thermoplastic support core and/or the cover layers or the material penetrating the perforated sheet on one or both sides are made of Plexiglas (PMMA), thermoplastic polyester (PET/G), polyamide (PA), polycarbonate (PC), polyethylene (PE), polytetrafluoroethylene (PTFE), polypropylene (PP), polyoxymethylene (POM), polyvinyl chloride (PVC) or a mixture of these substances having identical or different melting points or of a duroplastic or duromeric material such as phenol resin, cresol resin (PF), urea resin (UF), melamine resin (MF), and polyester resin (UP) or a mixture of these substances.

109. (new) The light scaffolding plate according to claim 102,

wherein, to achieve better strength and rigidity, modulus of elasticity, modulus of bending and creep, hardness, dimensional stability in the heat, tearing and tensile strength, compression resistance, dimensional stability, density, fatigue strength, thermal

conductivity, melting viscosity, reduction of stretching, impact toughness, impact strength when notched, creep tendency, shrinkage, thermal expansion, abrasion resistance, UV and weather resistance, and melt flow index, additives which influence these are admixed with the thermoplastic material or parts thereof, such as talcum, wood flour, wollastonite, zinc oxide, metal powder, mica, calcium carbonate, or other suitable substances, or the materials themselves already have different melting points.

110. (new) The light scaffolding plate according to claim 102,

wherein it has a width of 58 to 65, 88 to 95, 118 to 125, or up to 150 cm, calculated with or without the lateral upward bevel, and a length of up to approximately 60, 100, 150, 200, 250, 300, 350, or 400 cm and may be attached sufficiently securely and removably to the scaffolding using securing pins or other securing devices.

111. (new) The light scaffolding plate according to claim 102,

wherein the lateral downward bevel in the region of the suspension at both ends of the plate is used as a displacement guard against the suspension and the suspension is secured on one or both ends of the plate using a permanently elastic plastic spring or flap which only opens to pressure, the plate has a slip-proof, raised, or depressed texture over the entire top of the cover layer or at individual points thereof, the perforated metal sheet on top and below in connection with the support core makes 70, 60, or 50% in the actual perforation makes up approximately 50, 40, or 30% with a sinking to 1 to 3 mm and thus absorbs the static strain towards sag at the required load.

112. (new) The light scaffolding plate according to claim 102,

wherein the perforated metal is either aluminum, also admixed with other metals, steel (hot galvanized or aluminized), stainless sheet steel, or other metals or metal composite materials and has either a simple perforation, a sinkhole, slotted bridge, projecting, lapped, or similar perforation or a depressed perforation in this or similar form and is provided with stabilizing beads, which are oriented to the cover layer, in the longitudinal for transverse direction of the plate and is provided with an additional primer (adhesion promoter) or a color layer toward the top or bottom.

113. (new) The light scaffolding plate according to claim 102,

wherein the external perforated sheet cover layer has unperforated metal strips between the rows of holes in the perforation, particularly in the longitudinal or similar perforation, in the direction of the main load towards sag and, in the event of sinkhole, slotted bridge, or similar perforations in the perforated sheet, which are positioned on one or both sides of the plate, preferably linearly parallel to the main sag direction upon load of the plate, and may even be offset to one another, the plastic material which penetrates the sheet at the hole locations has multiple connections, equal to the multiple holes, which are formfitting, similar to rivets or flat rivets, between the perforated sheet and support core, so that a homogeneous connection arises which is distributed over the entire plate area.

114. (new) The light scaffolding plate according to claim 102,
wherein the perforated sheet cover layer is provided over the entire area on one side only on top and is provided with lateral C-shaped, L-shaped, or U-shaped stiffening downward bevels, which completely or partially enclose the support core on the other side.

115. (new) The light scaffolding plate according to claim 102,
wherein it or the lateral projection parts which are molded or placed on has an identification or inscription, also as an advertising text, which is visible over the entire area and/or only through the holes of the perforated sheet cover layer, is colored permanently, weather resistant, and UV resistant in the plastic material in one or more colors by choice and/or in the metal cover layer, or is provided with a primer/adhesion promoter.

116. (new) The light scaffolding plate according to claim 102,
wherein it has a small or large climb-through opening having an inserted flap made of identical material, which is connected to the plate either using typical hinges or preferably using a flexible cover and hinge layer made of permanently movable, thermoplastic material, and permanently actively closes the climb-through opening automatically or by actuating the closure after climbing through, the frame for hanging the flap of the climb-through opening containing reinforcements and the flap being made of the same material as the plate, either in the same or much lower thickness.

117. (new) The light scaffolding plate according to claim 102,

wherein, through a deformation of the cover layers, these become supporting webs or profiles within or at the edges of the support core or are used themselves as the support core, and within the plate or as a lateral terminus of the plate in the longitudinal direction, one or more pipes or U-profiles made of metal or fiberglass-reinforced plastic, also enclosed or molded out of perforated sheet metal, are welded in or on or glued in or on to absorb elevated loads or only as a boundary terminus.

118. (new) The light scaffolding plate according to claim 102,

wherein the scaffolding plate cover continues with identical surface in one piece without interruption up to the end of the web of the claw or round groove of the suspension fitting or the two suspension fittings, the metallic scaffolding plate cover layer is embedded in the plastic cover layer at its edges as a protection from injuries and the web of the claw of the suspension part is positioned perpendicularly to the scaffolding plate or is positioned angled up to 45 degrees to the scaffolding plate or with a slight angle inward and the opening of the claw of the suspension part, up to its throat, has a depth of 10 and at most 20 mm, of 20 and at most 30 mm, of 30 and at most 48 mm, or a larger dimension.

119. (new) The light scaffolding plate according to claim 102,

wherein the rounded area of the suspension groove is crescent-shaped or only partially crescent-shaped, the web of the claw of the suspension part simultaneously supports the holding of the plate on the rising web of the holder profile through appropriate deformation, and a component of the suspension part of the plate, both for the claw and for the suspension round groove, is a holding guard engaging on the holding profile or suspension pipe.

120. (new) The light scaffolding plate according to claim 102,

wherein a perforated metal plate is embedded or welded bodily enclosed permanently in a thermoplastic layer, plate, or film made of one or more layers, in the perforated metal plate, all or only some holes of the plate have hole edge depressions, the perforated metal cover layer has a constriction of the hole tapering conically inward on all or only individual hole edges, and all or individual holes of the perforated metal cover layer simultaneously have edge depressions and the material of the cover layer narrows in

thickness toward the hole center on all or individual hole edges.

121. (new) The light scaffolding plate according to claim 102,

wherein the edge depressions of the perforated metal cover layer have the height, more than the height, or less than the height corresponding to the material thickness thereof, the edge of the holes in the perforated metal cover layer runs from top to bottom at an angle of 25 to 65 degrees toward the hole center and is or is not flattened shortly before the opening of the hole, and the height of the downward bevel may exceed the plate thickness by up to multiple times.

122. (new) The light scaffolding plate according to claim 102,

wherein, from the viewpoint of the plate center, a groove is molded onto the entire plate width in front of the outer downward bevel(s), from the viewpoint of the plate center, a semicircular or partially semicircular recess is provided in front of the outer downward bevel (s) on both sides on thinner plates and continuously on thicker plates, and it is provided in the main support direction with grooves, beads, and/or upward and downward bevels and, within the plate area, it has small or large recesses, with or without plates or inserted covers of the same or lesser thickness, also bonded to the plate using elastic thermoplastic material.

123. (new) The light scaffolding plate according to claim 102,

wherein both the thermoplastic support core in direct connection and also the cover layers as intermediate layers of the welded connection to the perforated metal are manufactured from polypropylene (PP) and the plate is therefore completely recyclable in spite of the different melting points of plastic and metal.

124. (new) The light scaffolding plate according to claim 102,

wherein all or individual holes of the perforated or sinkhole perforated sheet metal plate are implemented as round or square holes, oblong holes, hexagonal or polygonal holes, diamond holes, triangular holes, star-shaped holes, keyholes having rounded corners or angled, or even as other types of holes and the plate has an area weight of up to 11, 9, or 7 kg/m² at a thickness of approximately 50 to 60 mm, an area weight of up to 10, 8, or 6 kg/m² at a thickness of approximately 40 to 50 mm, an area weight of up to 7,

6, or 5 kg/m² at a thickness of approximately 20 to 30 mm, and an area weight of up to 6, 5, 4, 3.5, or 3 kg/m² at a thickness of up to 20 mm.

125. (new) The light scaffolding plate according to claim 102, wherein the perforated metal or sinkhole perforated sheet metal cover layers in an aluminum alloy, which are bonded to plastic, each weigh approximately 0.6 kg to 1.8 kg and are 0.3 to 0.5 mm thick, the thermoplastic support core, with or without reinforcement, weighs 0.6 to 1.0 kg/m² per centimeter of thickness, and the finished compressed plate having aluminum cover layer is chemically treated or anodized in a selected color in the anodizing bath in the cover layers together with the visible plastic parts.

126. (new) A light plate analogous to a scaffolding plate according to claim 102,

wherein it is used as a floor plate, timbering plate, wall plate, wall panel, sound protection plate, thermal or sound insulation plate, roof panel, support layer for a photovoltaic laminate or for photovoltaic cells, table or table tennis plate, bench or chair, also having molded-on and foldable legs, door, gate, or garage door, stair step, as a decorative plate and for vehicle superstructures, as well as many other products, and molded as a supporting profile and it is used as a vacuum panel if a gas-permeable support core and a gas-impermeable film which encloses it are provided.

127. (new) A method for manufacturing a light support plate according to claim 102 in a stationary plate press or double-band press,

wherein the plate is compressed from a thermoplastic support core, which determines the color of the outside of the plate, or other spacers in oversized thickness and required width and length in the middle, over which only a sheet, a perforated sheet, or a sinkhole perforated sheet is laid on the top and bottom, in a single hot press and cold press pass having temperatures for heating and cooling tailored to the different melting points of the materials and the material thicknesses in direct contact with the hot and subsequently cold plates of the press and/or the possibly required, also textured separating film(s) and is thermoplastically bonded to the panel, whose later thickness and color design are previously determined, and receives the final, depressed or raised surface structure

and shape and, if corresponding molding tools are used, additional molded-on parts such as claws, grooves, and other suspension fittings, closures, reinforcement, inserts and web inclusions, edges, and holes.

128. (new) The method for manufacturing a light scaffolding plate according to claim 127,

wherein the plates are pressed in a single pressing pass laid next to or one behind another in multiple units and in which the liquid thermoplastic compound arising from the thermoplastic cover layer and/or the surface of the support core during the hot pressing flows through the holes, fills up the depressions in the plate, and, during the subsequent cooling, forms the solid rivets required for the bodily formfitting bond or the clawing.

129. (new) The method for manufacturing a light scaffolding plate according to claim 127,

wherein, when a perforated metal plate is used, the liquid thermoplastic compound arising from the thermoplastic cover layer and/or the surface of the support core during the hot pressing flows through the holes and expands over the holes into a flat plastic layer and, during the subsequent cooling, forms the connection pins to the flat plastic layer required for a bodily formfitting bond or the clawing, the stability, the modulus of elasticity, and the UV and weather resistance of the plate, in addition to the strength and the material properties of the cover layer, being influenced by sinking the holes and/or through offset arrangement of the holes in the direction of the strain.

130. (new) The method for manufacturing a light scaffolding plate according to claim 127,

wherein the method is performed in a continuously running extruding procedure with the honeycomb support core, with or without flattened plate surface, or a continuously running deep drawing procedure for a support core in a tubular, cap, box, web, corrugated, or similar structure, the introduction of slots in the honeycomb structure, with subsequent hot pressing of the cover layers of identical or different thickness from the coil or as a plate in the continuous or plate press clocked method, with or without the application of depressed or raised structures or surface coatings such as a slide protection structure or

perforated metal or sinkhole perforated metal or similar layers, notching slots, holes, or similar things, the subsequent edging and fitting molding and the trimming or cutting while maintaining or introducing the required, exactly controlled melting temperature at the surfaces to be fused and material underneath to be melted and subsequent cooling in the subsequent cold press, each under electronic or manual control and precise consideration of the temperature window required for the material.